the wearer. The hardware must be attached to the suit in a manner that allows the wearer to operate it easily and that prevents it from attaining a position in which it can be operated improperly.

(g) *Metal parts.* Each metal part of an immersion suit must be—

(1) 410 stainless steel or have salt water and salt air corrosion characteristics equal or superior to 410 stainless steel; and

(2) Galvanically compatable with each other metal part in contact with it.

(h) *Suit exterior.* The primary color of the exterior of each suit must be vivid reddish orange (color number 34 of National Bureau of Standards Publication 440). The exterior surface of the suit must resist tearing and abrasion when tested as prescribed in §160.171–17 (n) and (o).

(i) Buoyant materials and compartments. Buoyant materials used in a suit must not be loose or granular. The suit must not have an inflated or inflatable chamber, except as prescribed in §160.171–11(a)(2).

(j) *Hand and arm construction.* The hand of each suit must be a glove that allows sufficient dexterity for the wearer to pick up a 9.5 mm (3/8 in.) diameter wooden pencil from a table and write with it, after being immersed in water at 5° C for a period of one hour. The glove may not be removable unless it is attached to the arm and unless it can be secured to the arm or stowed in a pocket on the arm when not in use. A removable glove must be designed so that there is no undue ingress of water into the glove during use. Each arm with a removable glove must have a wristlet seal that meets paragraph (e) of this section.

(k) *Leg construction.* Each suit must be designed to minimize or reduce free air in its legs when the wearer enters the water headfirst.

(l) *Foot construction.* Each leg of a suit must have a foot that has a hard sole or enough room for a work shoe to be worn inside. The sole of each foot must be—

(1) Natural or synthetic rubber that is ribbed or bossed for skid resistance; and

(2) Designed to prevent the wearer from slipping when the suit is tested as prescribed in §160.171–17(c)(5).

(m) *Size.* Each adult suit must fit persons ranging in weight from 50 kg (110 lb.) to 150 kg (330 lb.) and in height from 1.5 m (59 in.) to 1.9 m (75 in.). Each child size suit must fit children or small adults ranging in weight from 20 kg (44 lb.) to 50 kg (110 lb.) and in height from 1.0 m (39 in.) to 1.5 m (59 in.). An oversize adult suit is intended for persons too large for the standard adult suit. Each suit must be capable of being worn comfortably over clothing and must not restrict the wearer's motion. The suit size and design must allow successful completion of the mobility tests prescribed in §160.171–17(c)(2) through (7).

(n) *Retroreflective material.* Each immersion suit must be fitted with Type I retroreflective material that meets subpart 164.018 of this chapter. When the wearer of an immersion suit is in any stable floating position, at least 200 cm^2 (31 sq. in.) of the material must be visible above water.

(o) *PFD Light.* Each immersion suit must be designed so that a light meeting the requirements of subpart 161.012 of this chapter can be attached to its front shoulder area and so that the light when attached does not damage the suit and cannot adversely affect its performance. If the manufacturer of the suit designates a specific location for the light, or designates a specific model light, this information must be clearly printed on the suit or in the instructions prescribed by §160.171–15(c).

(p) *Inflation tube.* If the suit has an inflatable auxiliary means of buoyancy, each joint in the oral inflation tube must be joined with a clamping device. A flange connection between the tube and the inflatable chamber must be reinforced so that the flange on the inflation tube is secured between the material of the inflatable section and the reinforcement.

§160.171–11 Performance.

(a) *Buoyancy.* Each suit must meet the following buoyancy requirements as measured in the test conducted under §160.171–17(h):

(1) The adjusted buoyancy of each adult and each oversize adult size suit

must be at least 100 N (22 lb.). The adjusted buoyancy of each child size suit must be at least 50 N (11 lb.) The measured buoyancy must not be reduced by more than 5% after 24 hours submersion in fresh water.

(2) Each suit must have a stable floating position in which the wearer's head must be tilted to a position between 30° and 80° above the horizontal, with the mouth and nose at least 120 mm (4¾ in.) above the surface of the water. If necessary, this position may be obtained through the use of an auxiliary means of buoyancy such as an inflatable bladder behind the wearer's head.

(3) If an auxiliary means of buoyancy is necessary to meet paragraph (a)(2) of this section, the suit must have a stable floating position without the auxiliary means of buoyancy in which the mouth and nose of the wearer are at least 50 mm (2 in.) above the surface of the water.

(4) The buoyancy of any auxiliary means of buoyancy must not be counted when determining the buoyancy of the suit.

(b) *Righting.* The suit must be designed to turn the body of an unconscious person in the water from any position to one where the mouth is clear of the water in not more than five seconds, without assistance or the use of any means of auxiliary buoyancy which must be inflated by the wearer; or to allow the wearer to turn from a face down to a face up position in not more than 5 seconds, without assistance or the use of any means of auxiliary buoyancy. If an automatically inflated means of auxiliary buoyancy is used to meet this paragraph, the inflation mechanism must meet the requirements for commercial hybrid PFDs in §160.077–15(c) of this chapter, and the tests required under §160.077–21(c)(3) of this chapter. Auxiliary buoyancy, if fitted and/or inflated, must not interfere with righting.

(c) *Thermal protection.* The suit must be designed to protect against loss of body heat as follows:

(1) The thermal conductivity of the suit material when submerged 1 m (39 in.) in water must be less than or equal to that of a control sample of 4.75 mm (3⁄16 in.) thick, closed-cell neoprene foam. The control sample of foam must have a thermal conductivity of not more than 0.055 watt/meter−° K (0.38 Btu−in./hr.−sq.ft.−° F).

(2) The suit must provide the wearer with sufficient thermal insulation, following one jump into the water from a height of 4.5 m, to ensure that the wearer's body core temperature does not fall more than 2° C (3.6° F) after a period of 6 hours immersion in calm circulating water at a temperature of between 0° C (32° F) and 2° C (35.6° F).

(d) *Donning time.* Each suit must be designed so that a person can don the suit correctly within two minutes after reading the donning and use instructions described in §160.171–15(a).

(e) *Vision.* Each suit must be designed to allow unrestricted vision throughout an arc of 60° to either side of the wearer's straight-ahead line of sight when the wearer's head is turned to any angle between 30° to the right and 30° to the left. Each suit must be designed to allow a standing wearer to move head and eyes up and down far enough to see both feet and a spot directly overhead.

(f) *Water penetration.* An immersion suit must be designed to prevent undue ingress of water into the suit following a period of flotation in calm water of one hour.

(g) *Splash protection.* Each suit must have a means to prevent water spray from directly entering the wearer's mouth.

(h) *Storage temperature.* Each suit must be designed so that it will not be damaged by storage in its storage case at any temperature between −30° C (−22° F) and +65° C (149° F).

(i) *Flame exposure.* Each suit must be designed to prevent sustained burning or continued melting after it is totally enveloped in a fire for a period of 2 seconds.

(j) *Oil resistance.* Each immersion suit must be designed to be useable after a 24 hour exposure to diesel oil.

§160.171–13 Storage case.

(a) Each suit must have a storage case made of vinyl coated cloth or material that provides an equivalent measure of protection to the suit.

(b) Each storage case must be designed so that it is still useable after